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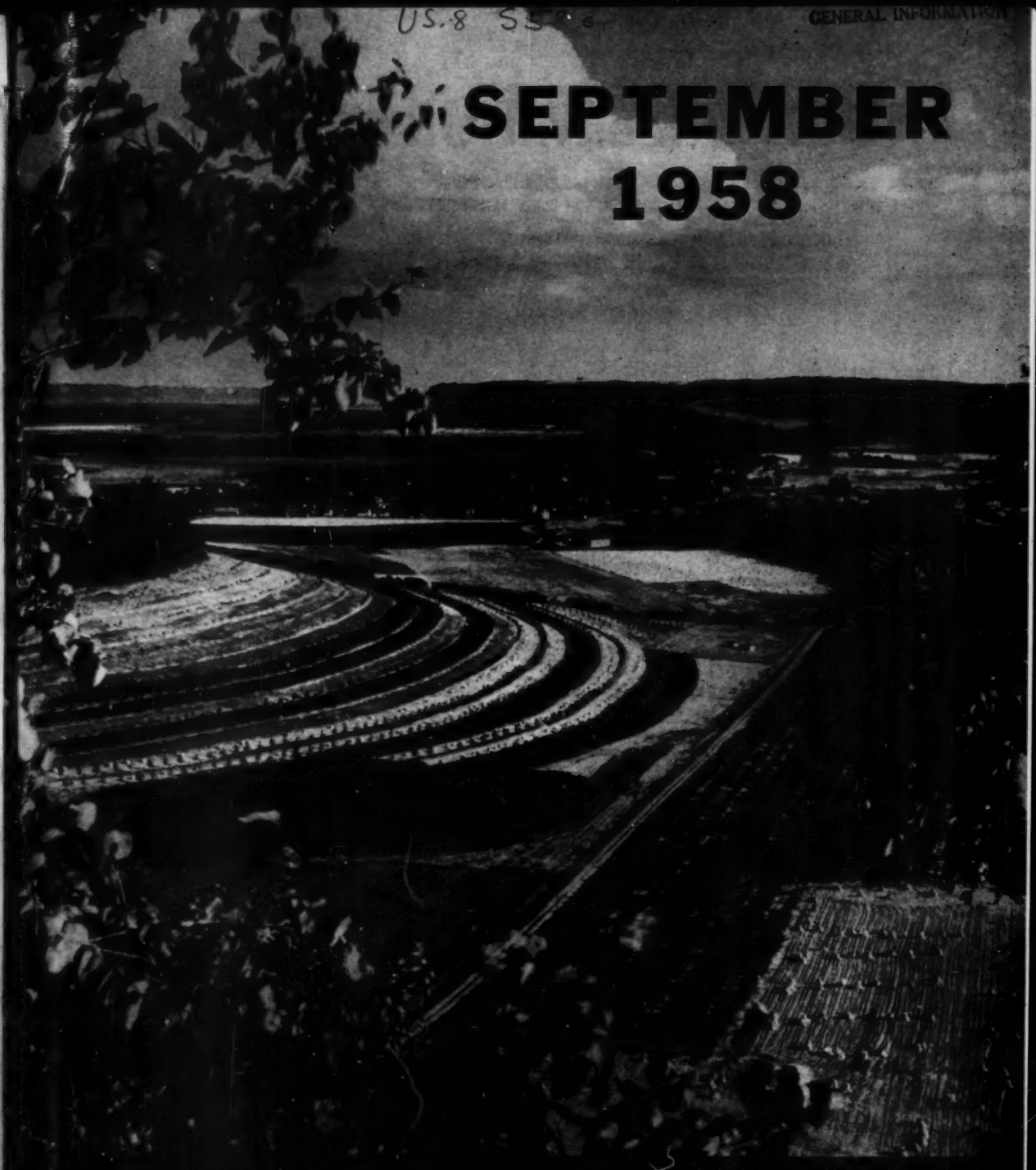

SEPTEMBER 1958

SOIL CONSERVATION

Soil Conservation Service • U. S. Department of Agriculture

SOIL CONSERVATION

SEPTEMBER—1958

VOL. XXIV—No. 2

EZRA TAFT BENSON
SECRETARY OF AGRICULTURE

DONALD A. WILLIAMS
ADMINISTRATOR, SOIL CONSERVATION SERVICE

OFFICIAL ORGAN OF THE SOIL CONSERVATION SERVICE
U. S. DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

★ THIS MONTH ★

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TOM DALE, Editor

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business. The printing of this publication has been approved by the Bureau of the Budget, June 26, 1958. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

15 CENTS PER COPY — $1.25 PER YEAR

FOREIGN—$1.75 PER YEAR

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Some of the out-of-the-way places where people pay money to read this magazine include: Hong Kong with 3 subscriptions, the Fiji Islands with 2, and Mauritius with 1. Paid subscriptions have been increasing steadily for several years in foreign countries.

In addition to the paid subscriptions, about 340 free subscriptions are sent to foreign countries. Nearly all of these go to government departments of conservation or agriculture and to public libraries.

Editors are invited to reprint material originating in this magazine.

FRONT COVER.—Patterns of conservation farming on a fruit and grain farm in southeastern Minnesota.

Photo by W. H. Lathrop

All orders go to the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

They Call Him "Humus Brown"

By BOB KANE

"SOIL building is fun, but it takes patience and determination to enjoy the fruits of your labor," according to John W. Brown, farmer-homesteader in the Black Canyon reclamation project at Caldwell, Idaho.

The Browns had their first look at the 90 acre farm that has since become their home early in 1951.

"This was new land," John said. "It had never felt the plow. The native sod, broken only by scattered patches of sagebrush, extended the length and breadth of the whole farm. My first look at the rolling hills with their gentle slopes reminded me of a peaceful challenge. As I stood there, half afraid and yet enthusiastic of what the future had in store for us on our first homestead, lines from Robert Lewis Stevenson's immortal poem, *Success* raced through my mind 'He has achieved success . . . Who has left the world better than he found it . . .'

Today it is a real eye opener to cross the fields on the Brown farm, and walk and look and hear John's simple, but matter-of-fact, story of soil building; a story evidenced by the face of his entire farm. The sweat and toil demanded for a good start have paid satisfying dividends.

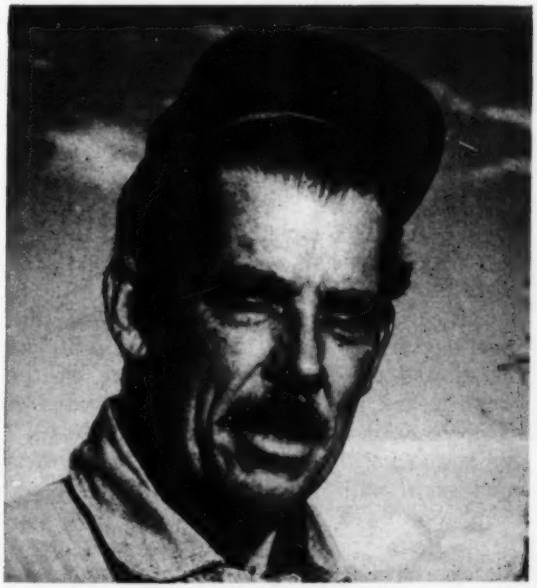
For example, the time required for each irrigation has been reduced by one-third, while the interval between irrigations has been more than doubled. Also the time required to meet the man-hour demands of the farm were reduced by one-third, and the over-all production on the farm has been more than doubled.

It's only appropriate to mention that this display of enthusiasm for something John really believes in and practices has not gone unnoticed by his friends and neighbors. In due respect, and justly so, John now answers in friendly circles to the popular nickname "Humus Brown."

It was a big thrill for the Browns when the first land leveling equipment moved onto the farm. "The high places were cut as much as 6 feet in depth, while fills in the low areas were as much as nine feet deep in places. It seemed like there was nothing left on the farm but bright colored subsoil," John Brown commented.

"No man can know how fast we learned that first year on the farm, learning just how many problems we really had to work with. Those were big problems and many are still with us today."

From the start, John recognized the soil as his biggest problem. It was a burned-out desert soil nearly void of organic matter. When the soil was wet it was slick and bottomless; when



John W. Brown.

Notice:—The author is work unit conservationist, Soil Conservation Service, Caldwell, Idaho.

Plowing under the third growth of alfalfa as green manure on the Brown farm.

dry it was so tight that a shovel could scarcely scratch the surface.

The Browns were located inside the Canyon Soil Conservation District and requested assistance on their farm. Technicians from the Soil Conservation Service studied the problems and helped John organize his plans. Since John is a conservationist at heart he was already sold on modern conservation practices—with him it was only matter of selecting the practices adapted to his farm.

A soil survey was made on the Brown's farm and showed all the land to be class III and IV. The 90 acres extends lengthwise from north to south with a small lateral canal running the length of the farm and dividing the class III land on the east from the class IV land on the west.

Soil Conservation Service technicians helped John prepare a complete farm plan based on the ability of his soils to produce. Among other things, the plan called for a 3-year rotation on the class III land. This included alfalfa-grass hay for 2 years (the third crop of hay was plowed under for green manure on the second year) and row crops for 1 year. A 5-year rotation was planned for the class IV land and included alfalfa-grass hay for 3 years, small grain with red clover seeded in green manure for 1 year, and grain with a new seeding of alfalfa-grass hay the fifth year.

It was hard for the Browns to know where to start. A house, some livestock, and the leveling had taken nearly all of their cash reserve except what would be needed for seed and fertilizer. The soil was all they had to work with and so that was where they decided to start.

The first crops were planned to provide green manure over as much of the farm as possible during the first season. In every grain crop John included a generous seeding of white blossom sweetclover, which was turned under in the early fall. Orchardgrass was seeded with alfalfa as a hay mixture to provide the soil-building qualities of the grass roots. Enough straw was baled to furnish bedding for the livestock during the winter and the rest was worked into the soil.

Slick spots are common in the Black Canyon and are characterized by "adobe" conditions combined with chemical problems to really make it tough.

The water intake rate of the soil was poor. "We turned from 4 to 5 gallons of water per minute down each corrugate," John explained, "and it seemed like every drop ran off the lower end of the field. We set the water on 700 foot runs for 72 hours, and sometimes longer, before enough water was taken into the soil to last until the next irrigation."

At the time, it seemed that the plan included all the essentials to see John's desires through to completion. During the second year of this plan, however, John recognized that one thing was lacking. On the slick spots, just where

A typical "slick spot" on the Brown farm that was rejuvenated by addition of large quantities of organic matter.

Stubble mulching on the farm of "Humus Brown."

organic matter was needed most, there was no plant growth. To correct this problem, John began to use industrial gypsum to neutralize the sodium carbonate present in the slick spots; and, dragged feed bunks onto these spots and fed steers and young heifers there over winter. John said, "This helped, but progress was too slow for the results wanted."

A more intensive soil-building program was needed to satisfy John's ambition. He talked soil building wherever he went and tried each new idea that seemed to offer an improvement over his soil building progress. "I discontinued using the plow except for plowing green manure crops and got a chisel-type tillage tool that I work from 12 to 14 inches deep," John explained. "This method mixes the crop residue with the soil much better than turning it under."

In addition to these practices, John continued to adopt other ideas. Each winter he purchased alfalfa and clover chaff at reasonable prices along with large quantities of wet straw that had been used to cover stacked hay. He also spread barnyard manure for his neighbors on 50-50 shares.

"I spread all this organic material on the worst spots of my fields, and still put a full application of barnyard manure from my own farm over the entire field," John said.

Along with these generous applications of organic matter, John likes to use a winter crop of rye and peas in a mixture for green manure whenever possible and follows it with a late-seeded crop such as corn or potatoes. Incidentally, he advised that very careful attention must be given to the application of commercial fertilizers with this type of a program.

John Brown has never allowed his enthusiasm for soil building to be dimmed, nor has he limited it to his own farm. In the fall of 1955, he was nominated and elected to the board of supervisors of the Canyon SCD. The following year he was elected chairman of the board and has since given added emphasis to the soil-building phase of the district program.

John's personal slogan is, "Let's make the Black Canyon blacker." Oh yes, and John still hopes to be one " . . . Who has left the world better than he found it . . . " His 90 acres anyway.

A GRAND JURY COMMENDS.—The Pickens, S. C., grand jury completed its work on indictments and made its presentment. In the presentment, the jury commended the Pickens Soil Conservation District for the work done on the Twelve Mile Creek watershed, and for the project being planned on the Golden Creek watershed. The jury suggested that farmers concerned in the Golden Creek project continue the work they are doing in promoting the watershed protection project.

Watershed Associations

Group Action Influences What People Think and Do and Often Provides the "Spark" for Greater Conservation Accomplishments.

By J. W. STEVENSON

SINCE its beginning, the Soil Conservation Service has regarded watershed groups or organizations as logical units to work with in helping put soil- and water-conservation programs into operation on the land. In the early thirties, demonstration projects generally were established to include a watershed area. The first demonstration area in the United States, Coon Valley, Wis., was one of them.

As the modern conservation movement spread and demands for help in planning and applying conservation measures on farm and ranch land multiplied, it became apparent that watershed groups or associations often stimulated more farmers and ranchers to use improved methods and to apply them more rapidly.

In some cases, these units were groups of people, closely knit by friendship and tradition, and accustomed to working together. The members simply formed a loosely organized watershed group. Many of these eventually expanded and took on the more formal organization of a watershed association. They were usually rural in nature, although urban landowners and agricultural-minded business and professional people sometimes participated. Soil conservation district officials often encouraged such organizations to help start or speed up conservation work.

Today, we have the latest development in the watershed associations, which, in many places, help the local sponsoring organization plan and put into effect the watershed-protection and flood-prevention work authorized by Public Law 566. These associations include not only farmers and ranchers, but also city people, wildlife enthusiasts, business and professional people, local government representatives—anyone interested in alleviating the flood and siltation damages in a watershed as well as stabilizing soil and water resources.

Observations made while working with watershed groups and associations the past two decades reveal some characteristics, which make such groups successful and shows the advantages of working with them.

Landowners, farmers, and ranchers resent "being told" how to manage their land. They are more likely to adopt new practices if they hear neighbors in their watershed talking about and approving them. This makes the ideas socially acceptable. People are even more influenced when others start using the newer methods. Patterns of life—or farming—can most easily be changed when they are group-formed and group-accepted.

Technicians and other representatives of government agencies must work to keep in the background. They can lend encouragement and provide information to the leaders of associations. But, nothing will stifle the true value and effectiveness of an association faster than a paid public official "taking over."

The leaders of an association may swing off on tangents at times. That is their privilege, however, and time sometimes proves them to be right. More important, the more leadership they assume the stronger their organization is likely to be in its activities.

Few things prime the pump of group enthusiasm more than good "publicity." Most of the successful associations have an appointed reporter to work with local newspapers and radio stations. In addition to creating enthusiasm and public support for community efforts, such an information program stimulates landowners and operators to develop and apply soil- and water-conservation plans on their land. Attendance at meetings is improved, and other watersheds become interested. Some associa-

Note:—This article was abstracted from a talk by J. W. Stevenson, work unit conservationist, Soil Conservation Service, Baraboo, Wis., Interagency Conference on Watershed Activities, Madison and Chippewa Falls, Wis., August 1957.

tions also publish their own newsletters for members.

The success or failure of a watershed association seems to depend directly upon its elected and appointed leadership. Size does not seem to make much difference. We have successful ones that have more than 400 farms and 57,000 acres and others that have only 35 farms and 6,800 acres. We have successful associations that meet twice a year, and some that meet regularly every month with special meetings as needed. The ideal seems to fall somewhere between these extremes with a picnic, tour, or field day during summer.

Good associations have goals to accomplish, projects to do, programs to work out. Aimless meetings for meetings' sake soon kill interest. Use of local talent, including musicals and plays, brings in new members and adds variety and interest.

The most successful watershed associations have been based on participation of entire families—dad, mother, and the kids. Today, many activities tend to split the family. Different people have said that being together is one of the things they like best about the meetings. Something of interest for the adults and for the youngsters is planned by many associations.

Projects give purpose to the organization. Some projects that Wisconsin associations have conducted successfully, follow:

The Narrows Creek Watershed staged a tree planting day. Farmers furnished tools. Each farmer teamed with a Kiwanis Club member to plant 5,000 trees and 40 rods of multiflora rose hedge. They put up 40 rods of fence to protect the area. Afterward they all had a family-style picnic. The townsfolk are still talking about this type of city-country relationship, and they have a continuing interest in watching the progress of the trees and the other conservation work.

The Plum Valley Watershed set up its own erosion test plots and silt-collection basins and posted signs for all to see. These plots were visited annually by the members to check the results, and the plots also were used by many other groups in the county.

Several watersheds including Plum Valley, Seeley, Dell, Hay, and Twin Creeks have developed parks and recreational facilities for their youth as well as soil conservation—another sign of increased community pride.

Watershed people are playing important roles in field days of various kinds, giving generously of their time and equipment, and working actively on the promotion of the event.

Because these associations are well-organized and are going concerns, they have been able to grasp new opportunities as they developed. Many received special help when the Pittman-Robertson wildlife projects were set up. These watersheds planted more than 120,000 trees and shrubs in a single year and fenced many woodlots.

The Dell Creek Association appointed men to go down the road selling trees where they were needed. As a result, they put in more than a quarter of a million trees in a single year, many more than planted before in the history of this area.

Plum Valley raises 300 to 400 pheasants each year to restock an area, where before such birds had been almost nonexistent. Incidentally, it won a national award and recognition for its work.

The oldest of the watershed associations, Plum Valley, organized in 1947, has 75 percent of its farmers as cooperators with the soil conservation district, as compared to about 40 percent for the district as a whole. This same area started without any 4-H or homemakers clubs, and now has active clubs of both kinds. The establishment of conservation practices on the land runs 83 percent ahead of the rest of the soil conservation district.

In another watershed, which has operated only 2 years in an area that had been tough to crack for years, 15 percent of all the conservation practices laid out for the district, were done. Yet, it has only 3 percent of the county farms.

Other agencies, particularly the Wisconsin Conservation Department, have found the watershed associations to their liking. They can work with the locally established, responsible groups. For example, the Department of Conservation is purchasing and leasing land along a trout stream, putting in stream improvement structures, planting trees, and stabilizing banks. Farmers are starting to conserve the soils that contribute floods and silt to the stream.

The philosophy of a farmer who lives in a watershed is found in this quotation from an article by Harold Kruse, farmer and editor of the Narrows Creek Watershed Association paper, the *Narrows Creek Ripple*: "In developing a well-rounded conservation program—soil, water, woodlands, and wildlife—we must not forget the fifth factor—beauty. Wisconsin has its State parks, preserved and managed exclusively for their scenic and recreational values, but these are merely isolated islands of beauty in the overall landscape. The true beauty of our State lies in its farms and woodlands, its lakes, streams, and marshes. It is difficult to picture a more pleasing scene than that presented by a healthy, prosperous and well-managed Wisconsin farming community, with its attractive farmsteads, abundant crops, and healthy livestock; its contoured fields and well-kept woodlands, fencerows, ponds, and streams abounding in birds, mammals, wildflowers, and aquatic life.

"Such a scene also includes healthy and happy people; our most important resource. It is the goal toward which we in the watershed associations work."

Cooperation On A Small Watershed

By RAYMOND C. KUBIE

How often have we heard the remark, "Soil and water conservation farming is all right, but I'm now too old to change my way of farming. That's for the younger generation."

Yes, it is all right for the younger generation and for 82-year-young, Joe Lesoing who lives 1½ miles south of Sprague, Nebr. Joe's farm is in the heart of the Upper-Salt watershed in sub-watershed No. 2. (This watershed, like many others, is broken down into a number of smaller watersheds.)

Watershed conservation, for very practical reasons, can best be developed and carried out on a sub-watershed basis. Usually only a few landowners are involved in a small sub-watershed and they can meet conveniently, receive the information, and make decisions that are necessary. For a watershed protection project to be successful, it requires the cooperation of everyone within its boundaries.

As part of the Upper-Salt watershed program, a floodwater-retarding structure was planned for the lower part of the drainageway that passed through Joe's farm. But before this structure or dam could be built there were many other things that needed doing. Basic to the watershed program, was the establishment of vegetative cover and other land treatment measures in the drainage area above the dam. This included the establishment of grass waterways, the construction of terraces and grade stabilization structures, the use of soil conserving crop rotations, improved pasture management, farmstead windbreak plantings, wildlife area improvement, and roadside erosion control.

One night early in the spring of 1954, Joe invited to his home all of the 12 farmers who farm or own land within the sub-watershed. At this group meeting an overall soil- and water-conservation plan was outlined for the sub-watershed area by Soil Conservation Service technicians. Many questions were asked and answers provided so that all would understand what this was all about. The idea of conservation "watershed-wide" appealed to the group. They decided to plan and apply the

Joe Lesoing in a gully at the site where the floodwater-detention dam was built.

Note:—The author is assistant area conservationist, Soil Conservation Service, Lincoln, Nebr.

Floodwater-retarding dam on the Lesoing farm with surrounding area covered by grass and trees.

needed conservation measures as rapidly as possible.

When the dust had settled by late fall, there were 37 miles of new terraces, 35 acres of waterways, 2 farm ponds, and 1 gully control structure installed within this sub-watershed. Other soil management practices were adopted, while grass and legumes were planted on the steeper land. Soil and water conservation was not new to this group since many of the farmers had previously applied some conservation practices. But in this case they had a goal in mind and set about accomplishing it in a more rapid manner.

Meanwhile, down on Joe's farm a contractor with several pieces of earth moving equipment was constructing a 29,000 cubic yard earth dam with 102 feet of 18-inch reinforced concrete pipe through it. The dam is 32 feet high and 750 feet long. The reservoir will temporarily store 173 acre-feet of water which, when released slowly through the 18-inch pipe, will require from 4 to 5 days to drain. This leaves a 4-acre permanent pool from 6 to 9 feet deep.

When migratory fowl head back north in the spring, one of the stopping places is on Joe's pond—at least for some of them. On occasion a few will remain until later on in the summer.

Boy Scout troops and patrols from Lincoln use the pond and adjacent grounds for overnight outings. Neighbor boys, as well as adults, enjoy many hours of recreation at Joe's. This partially spring fed pond is in a natural setting with trees bordering on the north and east and a well-grassed slope with some trees on the south. Winds do little to ruffle the quiet water surface. Just to sit on the banks and gaze at the cool, placid waters and nature's surroundings is refreshing and relaxing for a tired man.

This concept of watershed conservation is not new in Nebraska. Our earliest soil and water conservation districts were established on a watershed basis. But, Mr. Lesoing and his neighbors, as many other watershed groups in the Lancaster Soil and Water Conservation District, have established a pattern and are doing much to further the idea of providing enduring benefit to their own and future generations.

DISTRICT PROFILE

H. W. ARRINGTON OF FLORIDA

H. W. Arrington, chairman of the board of supervisors of the Levy Soil Conservation District has the reputation of being one of the best supervisors in Florida. The Levy District was organized in 1948, and Mr. Arrington has been elected chairman of the board every year but one.

In the 10 years he has been active in district work, he has never missed a meeting of the local board, never missed an area meeting, and missed only one State meeting. Besides being chairman of the local board he is also a director of the Florida Association of District Supervisors.

There are many district accomplishments which justify calling him an active, hardworking supervisor.

Levy District had an essay contest for school children 7 years ago—one of the first in the State. It ran for 3 years, and was dropped only when the State association started a statewide speaking contest. The Levy District participates in the speaking contest and provided the first winner.

Levy District won the Goodyear contest 2 years ago.

Each year, Levy holds an Accomplishment Day on April 1, with an average attendance of about 500 persons.

At each monthly meeting, Mr. Arrington arranges to have some particular group of people present, such as bankers, teachers, or ministers, as guests.

Levy District gets a $500 apropriation from the county commissioners each year to help run the district.

It was largely through Mr. Arrington's efforts that the Levy District was organized.

"I was born in Levy County in 1885," said Mr. Arrington, "and in the past 73 years I've seen the land grow poorer and poorer. Levy is a sandy county and one of our problems is wind erosion. Many's the time I've been driving up the road to Trenton and couldn't see 100 feet ahead of me, the air was so full of blowing topsoil."

Besides wind erosion there was leaching and a considerable amount of water erosion, even though much of the land appears to be level.

All of this had combined to bring about a condition that was being reflected in damaged land, lower yields, and a general deterioration in farming in Levy County.

Today, the situation that existed 10 years ago has changed—dramatically and profitably.

"Ten years ago a little lupine, and a little pangola and Bahiagrass, was being planted, but there wasn't a wind strip in the whole county," Mr. Arrington told me.

H. W. Arrington.

Today there are several thousand acres of pangola and Bahiagrass and several thousand acres of wind stripping.

"Wind stripping has meant thousands of dollars to Levy County watermelon growers alone," says Mr. Arrington. "Levy is the biggest shipping point in Flordia for watermelons. And wind erosion will ruin a watermelon crop. Blowing sand will damage the young vines severely. It will whip the growing vines and knock off the blossoms thus resulting in fewer melons. And finally, it will scar the melons so that many will be graded No. 2's regardless of size.

"We still have some wind erosion but not anything like it used to be."

Grass-based rotations are being pushed vigorously by the supervisors.

Tree planting is getting to be a big item in Levy. Most of the trees being planted are slash pines and they are set out along fence rows, thus being made to serve as windbreaks.

"Where farmers have worked with the district in applying recommended conservation practices, production has been built up as much as 50 percent," he told me.

Mr. Arrington was born and brought up on

a farm and has been a farmer all his life. He still supervises a 160-acre farm belonging to his sister, and runs a few cattle, but as he pointed out, when you get to be 73 years old, you have to begin taking it a little easier.

But, if Mr. Arrington is not actively engaged in farming any longer he still devotes a lot of time to running the district and serving on many agricultural committees and boards.

He is vice president and a director of the Levy County State Bank, and he is also an honorary member of the Florida Sheriffs Association, an organization that works with deliquent youth of the State.

In 1956, he won recognition from the Florida chapter of the Soil Conservation Society of America for making the greatest contribution to soil and water conservation in the State.

He has been awarded so many certificates and plaques that he is hard put to find a place to display them all.

I came away from my interview with Mr. Arrington with the definite impression of having met and talked with Clarence Buddington Kelland's fictional character "Scattergood Baines." From his seat on the steps of his store there's little that escapes his attention.

He doesn't have many customers now, since it's easy to jump in the family auto and drive up the road to the supermarket, but people still go by the store to talk with him and get his advice on all sorts of matters. And, as he sits there and dispenses words of wisdom, you may be sure that he never misses an opportunity to talk about the advantages of conservation farming and how it contributes financially, socially, and spiritually to everyone in the county.

H. W. Arrington deserves everything that is said about him by his friends and neighbors in Levy County for the many fine things he has done for the county. But after talking with him for the better part of an afternoon, I am confident that no accolade would please him more than to be remembered as an active, hardworking district supervisor, who spent the last years of his life working assidously and devotedly for the physical improvement of the land and the economic improvement of the people who farm the land in Levy County.

—LEON J. SISK

From "Roughneck" To Rancher

A Former Oilfield Worker Owns and Operates a 14,000 Acre Ranch the Conservation Way.

By ALBERT P. THATCHER

ROY SIMS raises Hereford cattle—and good ones, too. Roy came to the Rock Creek country while in his teens and spent most of his younger manhood working as a "roughneck" and driller's assistant in the oil fields near there. His folks once owned a ranch in the Little Snake River Valley near Dixon, Wyo. With this background, Roy always yearned to own a ranch of his own some day. His dreams have been realized. Today, he and his wife, Opal, own a 14,000 acre ranch on Rock Creek near McFadden, Wyo.

The ranch consists of about 1,100 acres of irrigated meadowland and 12,900 acres of rangeland. Roy runs about 400 breeding cows with about 1 bull to every 35 cows. The cows drop their calves around the middle of April, and the calves go to market about October 15. Last year his steer calves averaged 377 pounds, which is somewhat below his par.

Severe drought in this part of the country curtailed the native-grass production and less-

Note:—The author is range conservationist, Soil Conservation Service, Laramie, Wyo.

Roy Sims repairing one of his cross fences.

ened the amount of irrigation water available the past 4 or 5 years. Even with these severe growing conditions, 377-pound calves at 6 months in the High Plains country is pretty good.

The quality of his calves can be attested by the fact that the same feeders from Toledo, Ohio, have contracted his calves the last 3 years. He has received notice that these same men want to obtain them again this year. These men wrote that the last batch of calves he shipped them weighed 1,000 pounds by September 1.

Roy attributes the thriftiness of his cattle not only to good quality of breeding, but also to the good care he gives his cows. He sees that they have plenty of feed while on the native rangeland during the grazing season and on the meadows during the winter and early spring.

Sims realizes that proper management is necessary to maintain good quality native forage on his rangeland. He manages his pastures so that the same field does not receive early grazing year after year. He believes in preventing damage to the native grasses by not grazing too close. He says, "Any time you allow livestock to take more than about 50 percent of the grass each year you hurt yourself."

Roy will tell you that plenty of watering

Opening the headgate from Rock Creek to the main irrigation canal on the Sims ranch.

Sims inspecting one of the concrete control structures used in his irrigation system.

locations are necessary to obtain uniform distribution of the livestock, thus preventing overgrazing in localized areas. On his rangeland there is at least one watering location in every section; and, on some sections as many as three watering places have been developed.

He has both stockwater dams and wells, but prefers the dams "2 to 1" because they require less upkeep. He believes in cross fencing his pasture to better control distribution of his cattle. He has built 3¾ miles of cross fences in the last 3 years.

Three years ago Roy started doing something about the improvement of his haylands. The common practice in this country has been to turn the water on the meadows early in the spring and allow it to remain until time to dry the soil prior to haying.

"The first thing a rancher must do if he intends to improve his meadows is to obtain water control," Roy says. Being an action believer, and not just a "talking" believer, he set out to build concrete water-control structures throughout the irrigated portion of his ranch.

Roy has started a reseeding and fertilizing program on his hayland. He says, "My idea is to plow these meadows, sow them to oats and peas for 1 or 2 years, and then seed them to a good quality hay mixture."

He is presently cooperating with the Agriculture Research Service in some fertilizer- and water-control studies on some old timothy and

alsike clover stands. The yields obtained from these studies are almost hard to belive. He is convinced that commercial fertilizers, when properly used, mean "money well spent."

He has cleared and leveled some willow land along Rock Creek, and while I was visiting him he showed me some moving pictures taken while harvesting the first crop of oats and peas from this land. The height of the oats and peas were as tall as Mrs. Sims was as she sat upon the tractor. What is most outstanding to the observer is that this land was yielding little usable forage prior to being cleared.

In the process of developing his ranch, Roy has sought assistance from every available source, including the Agricultural Conservation Program and Extension Service. He asked assistance from the Laramie Rivers Soil Conservation District in 1953. He has developed a complete conservation plan for his ranch through help of Soil Conservation Service technicians.

Roy Sims also is an inventor. He has built a post hole digger that is something to behold, especially when in action. By the speed with which he can drill post holes, you can see why fence building is not much of a chore around the Sims ranch. He has also constructed an elevator-operated cattle dipping vat, which is the envy of his neighbors. His handiness with machinery is undoubtedly a carryover from his days as an oilfield worker. His adeptness with machinery is evidenced by an almost continuous demand for his services from his neighbors.

A Conservation Plan Involves
The Whole Farm Business

No. 37

This is the thirty-seventh of a series of articles to appear from time to time in explanation of the various phases of research being conducted by the Department of Agriculture on problems of soil and water conservation.

By ROSS V. BAUMANN

THE last 10 years have been a good period for the adoption of conservation farming. Prices of farm commodities and farm incomes were relatively high. The weather was favorable much of the time. Farmers who adopted conservation systems were in good position to withstand the drop in net farm income that frequently occurs in the first few years after adoption of a conservation plan.

Note:—The author is agricultural economist, farm economics division, Agricultural Research Service, Ames, Iowa.

Because of the favorable weather, farmers obtained good stands of pasture and hay. Beef cattle prices were more favorable than hog prices, and numbers of cattle were increased to consume the extra forage. The relatively good market for forages, through cattle, favored rotations that included higher proportions of forages.

The continued upward trend in farm costs, as prices of farm products turned downward from World War II levels, encouraged the use of new farming practices as one way of meeting the cost-price squeeze. Farmers were interested in trying newer techniques, even though the potential returns from some of them might not be immediate.

Most farmers who have adopted conservation plans recognize that overall farm planning for conservation is necessary if the practices that control erosion are to be profitable. Also they recognize the need for additional investment in cattle, for example, to utilize the forage in conservation rotations.

It is therefore important that public agencies such as the Soil Conservation Service and the Agricultural Conservation Program Service provide farmers with complete information, including changes required in enterprises and practices, capital needed, and probable returns from a conservation system of farming. There are waterways to establish, terraces to construct, and rotations to follow. In addition, the rest of the farm business must be altered to make the best use of the conservation system. The changes associated with land conservation measures often require more capital investment than the measures themselves. A certain amount of income must be foregone while these changes are progressing. Conservationists need to recognize the impacts of proposed conservation plans on the farm business as a whole.

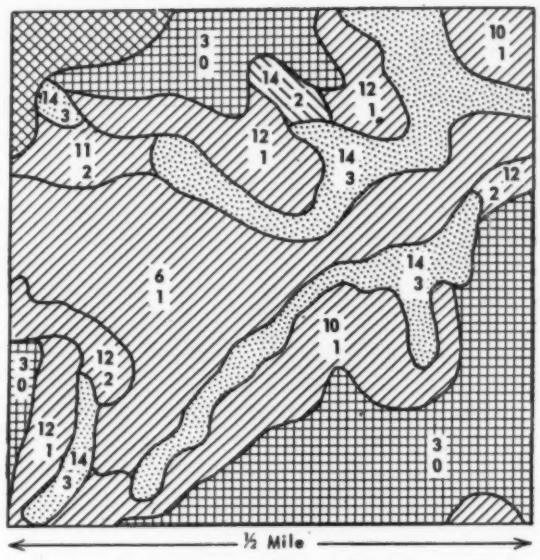
A farm typical of many in the highly productive hilly areas of western Iowa was chosen for study to show the changes in farm organization that need to be made in adjusting to a conservation system of farming. The farm is just above the Missouri River bluffs in Shelby County where slopes are relatively steep. The major upland soils are members of the Ida and Monona series, which have been formed from loessial materials. Gullies form quickly even with moderate rainfall. But the land is productive and responds well to good management.

As outlined on the soil map, a broad ridge of Monona silt loam crosses the farm diagonally from west to east. North and south of this ridge are areas of steeply sloping Ida silt loam. In the northwest and southeast corners of the farm are areas of more level Napier and Hornick silt loams.

The annual cropping system, before conservation planning, included about 62 acres of corn, 53 acres of oats, and 41 acres of hay and pasture. Erosion had been severe on the Ida slopes. But the operator had been alert to keep the small gullies filled by working earth in them as they developed. The soil loss was estimated to be about 27 tons per acre in 1956.

By use of terracing, contouring, and improved rotations, the farmer can reduce soil erosion to about 5 tons per acre. A conservation crop rotation should include 60 acres of corn, 40 acres of oats, and 56 acres of hay and pasture. The acreage of each crop in the rotation would vary from year to year because of the differences in area of the several classes of land. Terraces should be put on the ridge shoulders. About a mile and a half of terraces would be needed. The Napier and Hornick soils would be farmed "heavier" (more grain), and the steep Ida soils, farmed "lighter" (more forages) than has been true in recent years.

More hay and pasture would be available under this system and more beef could be produced. The present organization includes about 150 hogs, 5 milk cows, and 7 steers. Assuming that the farmer prefers not to milk any more cows, we have budgeted his livestock program to include more steers, which are bought in the fall, wintered, and fed on



Soil map of the Shelby County, Iowa, farm used for study. The upper figure in each plot indicates the percent of slope; the lower figure indicates the degree of erosion.

pasture. But as he works into the plan he will soon be able to support 18 to 20 head and to maintain his present hog enterprise. The numbers will fluctuate from year to year along with the feed produced annually.

The operator could adopt the conservation system and maintain it with his present labor. The system would require some additional investment in livestock, buildings and equipment, fertilizer, and terracing. The terracing could be established for about $320 ($4 per 100 feet of terrace) with an additioinal investment of about $25 for seeding watercourses.

The annual changes in farm organization for 10 years were estimated. The progressive changes are a result of improvements in organization associated with the conservation measures and the use of fertilizer. The increases in income are a result of the combination of conservation and other productive practices and the reorganization of the whole farm business that is associated with the conservation measures.

As productivity builds up, more feed—both grain and forage—becomes available. The number of steers can be increased gradually from 7 to 21 over a 10 year period, while hog numbers are maintained near the present level. The increase in productivity is due largely to the use of fertilizer and a better crop rotation. Net farm income would increase accordingly, from about $5,500 to $7,000. Heavy applications of fertilizer, particularly in the first few years of a conservation program, help to overcome the drop in net farm income that ordinarily occurs.

As projected in the conservation plan, the new crop rotation, terracing, contouring, and seeded waterways would be established the first year. Seven steers would be fed, and 154 pigs would be raised. By the fifth year, the number of steers could be increased to 12, and 7 more could be added by the sixth year. By the tenth year, 21 steers could be fed along with the hogs and milk cows.

These changes require additional capital for the investment in steers, a hog house, feed bunks, and an open shed. The first investment would be for terraces, seeding of waterways, and fertilizer. To increase hog numbers from 154 to 166 by the end of the fifth year, additional housing and equipment would be needed. The investment in housing and equipment would be necessary by the third year when feed would be available for part of the expansion. The operator might decide not to invest in additional housing and equipment for hogs if he believed that he would not use it beyond the 10-year adjustment period. Instead, he would sell or store the grain for future use.

By the fifth year, additional housing and equipment would be needed for steer feeding. This would amount to approximately $1,050 if he bought a metal building, or if he used pole-type construction and assembled the shed himself. Otherwise, it would cost about $200 more. To these investments would be added the annual cost of fertilizer and the cost of the additional steers needed to use the increased production of forage.

The first year, the additional investments would amount to $674. By the 10th year, they would accumulate to $3,714. Interest at 6 percent would be $223 for the 10th year.

The investment in conservation and associated enterprises would be quite profitable. The average annual increase in net income would be about $1,500 by the 10th year. This would compensate the operator adequately for the greater interest cost and the expense of the extra labor.

However, not all farms are as productive as this example farm, on which a conservation system could be established with little difficulty. More terracing and hence a relatively larger investment would be needed on some farms.

The land in the farm, the capital resources, and the labor or human resources are all involved in the development and adoption of a conservation system of farming. They should be considered as functioning simultaneously in the farm plan for each farm.

WATER FOR EVERYONE.—If we are to continue to have water for everyone, rural and urban people must join in managing and using the water resources in each watershed.

—D. A. WILLIAMS

"The Wonder Of Water"

Third Graders Use SCSA Booklet as a Text and Reference in Their Study of Water.

By JOSEPH SACCO

THE Soil Conservation Society of America pamphlet, "The Wonder of Water" scored heavily with third-graders at Oaklyn School, Sunbury, Pa. Their teacher, Mrs. Louise Evans, reported on the results to directors of the Northumberland County Soil Conservation District, who had furnished her copies of this popular, "comic-book" style publication.

Children used the booklet as a key reference in a thorough study of water for daily living, for plants and animals, for transportation, for pleasure, and for beauty. And also, as a potential menace when uncontrolled.

Note:—The author is work unit conservationist, Soil Conservation Service, Sunbury, Pa.

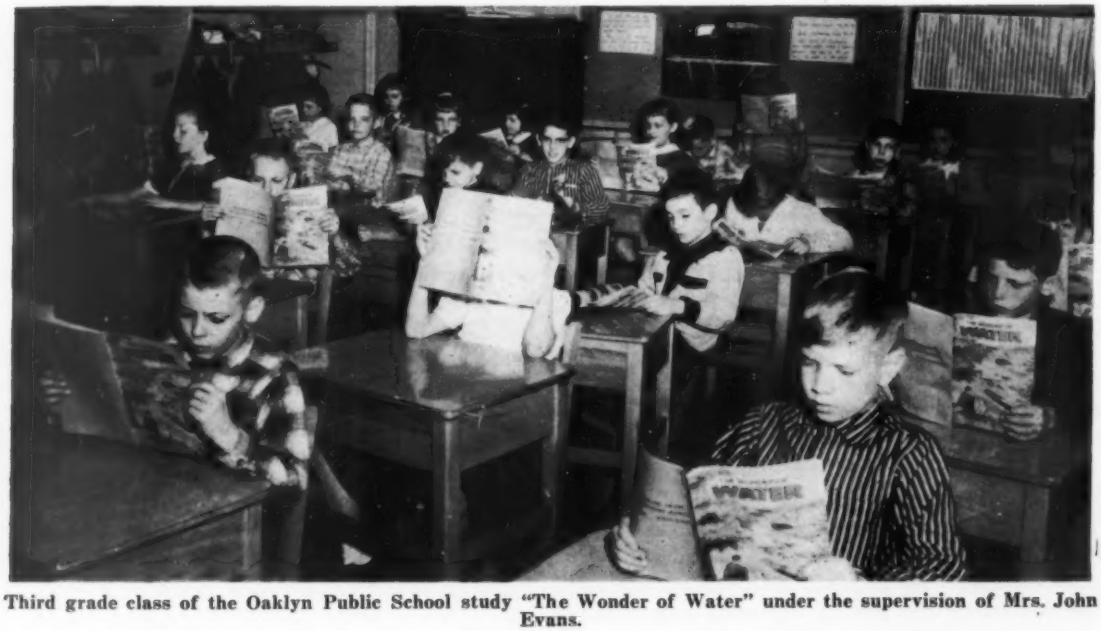
Inspired by the booklet, the youngsters developed projects in sanitation, weather, water-supply systems, drainage designs, and watersheds. They assembled a scrapbook, including photos, that showed how diversion terraces and other conservation practices put water "into harness."

Led by Mrs. Evans, they conducted many simple experiments on the mysteries of water, such as comparing fresh and dehydrated fruit and vegetables, measuring the moisture in melted snow, and noting condensation on cold windowpanes.

Highlight of the third-graders' water study was creation of large multicolored charts that showed what happens to precipitation, with and without soil conservation measures applied to the land.

Then the children took a close look at soil and water progress in their own neighborhood. Mrs. Evans reported they were greatly impressed by the Stone Valley Watershed protection project, 15 miles from Sunbury.

Mrs. Evans is one of several teachers to receive classroom copies of "The Wonder of Water" from the Northumberland SCD directors.



Third grade class of the Oaklyn Public School study "The Wonder of Water" under the supervision of Mrs. John Evans.

A Unique Conservation Exhibit

By PHILLIP J. TICHENOR

A STEADY rain shower on terraced and stripcropped land and over grassed meadows and waterways is seen by persons who view a unique soil- and water-conservation exhibit built recently in Minnesota.

The scale-model display was made to show how proper conservation practices help farmers save both soil and water on rolling land. It was constructed by Harlie Larson, Extension Soil Conservation agent at Caledonia, in Houston County, aided by local farmers and members of the Root River Soil Conservation District.

The exhibit is mounted on an 11- by 4-foot table. On the table itself there is a 3 dimensional field scene, with cropping patterns represented by colored terry cloth, put together in such a way that all cropping is on the contour. As the rain falls, the person who is viewing the exhibit can see how terraces carry the water to a "grassed waterway" which in turn carries the runoff to a pond below.

A pair of screens in the "sky" overhead distribute water from a perforated plastic pipe in such a way that actual rain seems to be falling. In the center of the display a grassed waterway leads to a farm pond and the "creek." This creek carries the over-flow water away from the pond to the back of the display.

Larson shaped the topography with sawdust, covered it with plastic to keep it dry, and put the terry cloth over the plastic. This makes it easy to dismantle and transport the exhibit.

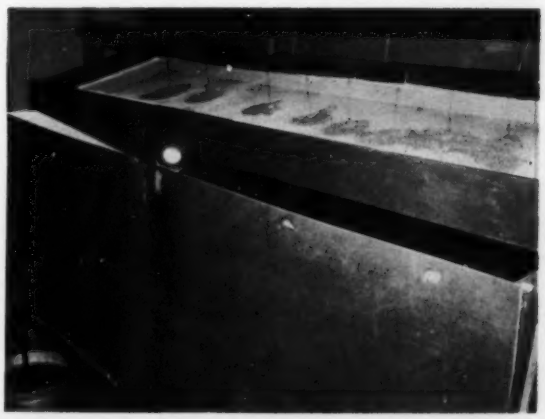
Water for the rainfall is pumped from a small tub in back of the exhibit and is sprayed from the perforated plastic pipe on the overhead screens. The water from the creek runs back into the tub and is used over again.

This exhibit was displayed at the 1957 Houston County Fair, and at the National Association of Soil Conservation Districts convention early in 1958 in Minneapolis.

Harlie Larson explaining his "rain in action" exhibit.

Larson is one of several county extension, soil conservation workers in Minnesota. These men concentrate on educational aspects of conservation and work in close cooperation with soil conservation districts and SCS personnel.

Part of the construction cost of the exhibit was paid by the Root River Soil Conservation District, and part was paid by the Minnesota Association of Soil Conservation Districts. Henry Haugland, Spring Grove, Minn., painted the scenery for the background—free of charge.



Water pumped from the tub, lower left, is released through perforations in the plastic pipe (above), and is dispersed by the fine mesh screen. A second screen, a few inches below, further disperses the water so that it falls on the fields as a fine mist.

Note:—The author is information specialist, Extension Service, University of Minnesota, St. Paul, Minn.

A Conservation Camporee

Boy Scouts Get a Three Day Short Course on Conservation on a Sportsmen's Association Farm.

By DAVID A. BENNETT

CONSERVATION recently took on real meaning for more than 400 Boy Scouts and their leaders in New Hampshire's Spaulding-Bay District. They will long remember the things they learned and did at their 3-day Camporee in 1958. So, too, will members of the Major Waldron Sportsmen's Association, who were the hosts on their 110-acre field and woodland tract in Barrington, N. H.

Conservation was not new to the members of this association—they had a conservation committee. They already were cooperators with the Strafford County Soil Conservation District, and they had a coordinated conservation plan. A lot of the conservation work, though, was still in the planning stage. The Scouts—well, they had the interest, the desire, and the enthusiasm that only boys at that age can muster. The result was a real bang-up conservation good turn.

Naturally enough, all of this didn't just happen. Boy Scout executives, association members, and technicians from just about every conservation agency—local, State and Federal—all pitched in and worked hard to make it a reality. Everyone agreed it was well worth the effort.

The program was in two parts: first, to teach the Scouts as much about conservation as possible, and second, to let them actively take part in applying their newly-learned arts.

Hugh C. Tuttle, director for the National Association of Soil Conservation Districts, got the program off to a fast start with his opening address. He set the stage by stressing the importance of wise land use. The importance of

Note:—The author is conservation aid, Soil Conservation Service, Rochester, N. H.

Hugh C. Tuttle, director, National Association of Soil Conservation Districts, talks about conservation to Boy Scouts.

the conservation plan developed by the sportsmen's association was brought out—he stressed how the woodland, cropland, and wildlife areas all fitted together into one master plan.

The educational part of the program was the "Conservation Trail." It consisted of 12 stations set up throughout the association's fields and wooded areas. Each station was manned by a specialist in some field of conservation. Here the boys learned first-hand about conservation and its importance to sportsmen.

The Scouts got a close look at a soil profile dug in a well-drained site; they learned how a soil scientist uses an auger, mattock, and shovel; and, they studied the soils and capability map of the association's property. This was followed by two more stations on soil and water conservation. Demonstrations were given on how soil is washed away when rain falls on unprotected soil and how this is stopped by good sod cover. The importance of soil and water in our everyday living was stressed. The conservation plan was used to illustrate how everything tied together.

The importance of trees and shrubs got plenty of attention. Foresters taught the boys how young seedlings should be planted. They followed this up with demonstrations on how to prune and thin, and how to get maximum use of a tree after it has been cut. Finally they discussed and demonstrated how to use forest fire-fighting tools.

The association's property includes a trout stream. Fish and game technicians found plenty of Scout interest in methods used to improve stream fishing. Scouts were shown how log deflectors and stone-detention structures can be built with readily available material. They learned how good soil and forest cover helped to protect and improve the stream. Here again the complete plan was stressed.

Other stations included such wildlife aspects as development of odd areas for migratory birds, animal pest control, and overall wildlife area improvement.

At the final station, State conservation officers talked to the Scouts about courtesy to landowners and landowner relations. They pointed out that poor sportsmanship was causing more and more land to be posted. To undo some of the previous wrongs would call for visiting with the landowner, taking an interest in his conservation plans, and above all respecting his property.

SCS soil scientist explains soil profile to Boy Scouts.

Enthuiasm for the second half of the program ran just as high as for the first half. In practically no time at all the Scouts had shovels flying and multiflora rose hedges planted. They thinned pine woodlots and pruned crop trees.

The Scouts surveyed three farm pond sites. There were plenty of instrument men and the dumpy levels really got a workout. One of the most popular sites was at the trout stream. Everything proceeded normally for a while and the log deflector took shape. Then most of the Scouts had a swim.

Scout group planting wildlife food plot on the Major Waldron sportsmen's farm.

Conservation was the main theme of course, but all of the other experiences of scouting were there—the troop campfires, outdoor cooking, and fishing in a well-stocked pond.

Everyone agreed the Scouts took a long step toward becoming conservationists, and the association's property was greatly improved by the actual conservation put on the land. The Camporee also provided the opportunity for just about every local, State, and Federal agency concerned with conservation to join hands with Scouts in "A Good Turn For Conservation."

Conservation Award Winner

Carl E. Haischer, SCS work unit conservationist at St. Mary's, W. Va., has been announced the winner of $500 and a bronze plaque in the American Motors Conservation Awards program.

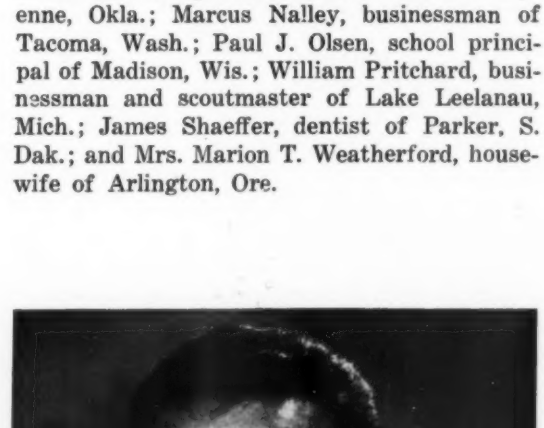
Haischer was selected to receive one of the 10 annual awards for professional conservationists for his work in promoting sound land use, particularly the raising of trees as a cash crop.

Formal presentation of the award is set for the national meeting of the Soil Conservation Society of America in October, at Ashville, N. C.

In addition to the land use planning and tree planting programs pushed by Haischer, he has written a weekly column promoting sound conservation practices for several weekly and daily newspapers since 1946.

The nine other professional conservationists who received awards similar to that of Haischer, are: Robert R. Bowers, Charleston, W. Va., of the West Virginia Conservation Commission; Robert Cooney, Helena, Mont., wildlife biologist with the Montana Fish and Game Department; L. E. Crawford, Lawton, Okla., retired enforcement officer with the Oklahoma Department of Wildlife Conservation: Guy M. Brandborg, Hamilton, Mont., retired National Forest supervisor; George Fell, Washington, D. C., executive director of Nature Conservancy; Paul Gilbert, Hot Sulphur Springs, Colo, wildlife biologist with the Colorado Game and Fish Department; Daniel L. Leedy, Silver Spring, Md., chief of the division of wildlife research in the Fish and Wildlife Service; George W. McCullough, Minneapolis, Minn; and Henry W. Moesch, Indianapolis, Ind., administrative assistant to the director of the Indiana Conservation Department.

The ten non-professional conservationists who received a bronze plaque, but no cash award, are: John H. Bailey, Johnson City, Tenn., a biology professor at East Tennessee State College; John Bain, industrial engineer of Palmyra, N. Y.; Theodore O. Hegseth, farmer of Carlyle, Minn.; Kenneth McLeod, Jr., time and motion analyst of Klamath Falls, Ore; L. L. Males, bank president and farmer of Cheyenne, Okla.; Marcus Nalley, businessman of Tacoma, Wash.; Paul J. Olsen, school principal of Madison, Wis.; William Pritchard, businessman and scoutmaster of Lake Leelanau, Mich.; James Shaeffer, dentist of Parker, S. Dak.; and Mrs. Marion T. Weatherford, housewife of Arlington, Ore.



Carl E. Haischer.

DISTRICT PROFILE

CHARLES GREENBACKER of CONNECTICUT

CHARLES GREENBACKER has been carrying the torch for soil and water conservation for many years. With crusading spirit, Greenbacker has been getting around to all the State's soil conservation district meetings. He has been transmitting the knowledge and the enthusiasm he picked up at the 1958 convention of the National Association of Soil Conservation Districts in Minneapolis. He figures that's part of his new job as president of the Connecticut Association of Soil Conservation District Supervisors.

Greenbacker has been closely identified with soil conservation districts since January 1951. That's when he became a cooperator with the New Haven County Soil Conservation District. He signed a district agreement to apply a coordinated soil conservation plan to the 350-acre dairy farm he owns and operates with his two brothers at Meriden, Conn. A conservationist at heart, it wasn't long before he was carrying the soil conservation message to others, within the district and beyond its borders.

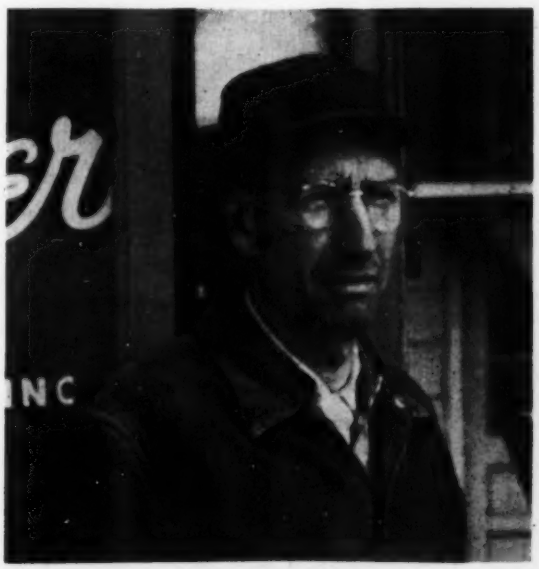
Because of his active interest in conservation, Greenbacker was made a district supervisor in 1953. The next year he was elected chairman of the board of supervisors. Now he's board secretary.

Greenbacker does not confine his conservation activities to district affairs. He attends all meetings of milk producers and retailers throughout the State. Because of his successful operation of a dairy farm, a retail milk delivery route, and a wayside milk and ice cream bar, his views receive respectful attention. At these meetings he always manages to get in a few licks for conservation farming.

He works closely and regularly with the State Commissioner of Agriculture. He makes a special point of getting to all public hearings within the State that relate to soil and water conservation.

At a Northeast area meeting of the National Association of Soil Conservation Districts, Greenbacker held the center of attention as a member of a panel named to discuss the problem of vanishing farmland. That subject—the conversion of farmland to other uses—has long been a source of concern to him. When it was discussed at the Minneapolis convention, he was fully aware of its import. He has been right in the middle of it himself. He has seen orchards and dairy farms ripped out in nearby Wallingford to make room for new homes for the industrial city's own expanding population and the overflow from New Haven and Hartford. On the north side of his own place, he has seen a hospital take over a large piece of an orchard. He watched with dismay as a cluster of colorful houses edged out a sheep farm on the south side. He saw a "For Sale" sign go up one day on the 160-acre farm across the road. The Greenbackers themselves have been under pressure to sell their farm for a housing development.

"We've been asked to set our own price," Greenbacker said, sadly. He continued: "Connecticut needs its farms for its increasing population. We don't have enough farms today to supply all our own food needs. That's why 30 to 35 percent of our milk comes from other States. No State can afford to be wholly dependent on outside sources for its food supply. We



Charles Greenbacker.

still need sources close to market. 'Farm fresh' still has meaning for many people."

With farmland dwindling, soil conservation has become even more important than ever before, he believes.

So far Greenbacker has been able to resist the temptation to sell his farm to real estate developers at a fancy price. He likes conservation farming. He likes it so well that he has done a good enough job on his own farm to win a national Goodyear conservation award. Conservationist that he is, he wants to keep on farming—the conservaion way.

—TED PAWLOWSKI

Early History Of Drain Tile

By M. M. WEAVER

EARLY American farmers have practiced underdrainage, of sorts, since colonial times. Stone, poles, brush, planks, and other materials were used for drains by these early American farmers. The first known record of tile being used in the United States was in 1835. This was when John Johnston, from near Geneva, N. Y., brought two pieces of clay tile from Scotland to use as patterns for handmade clay tile to be used on his farm. Stone, wood, and mortar were also used as materials for making tile, however, even after the clay tile were brought here by Johnston.

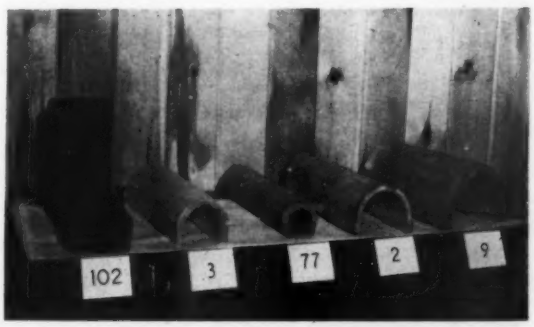
All clay tile was handmade in the United States until 1848. The clay was rolled out on a board somewhat as a housewife rolls cookie dough. Rectangles of the proper size were cut from the rolled clay and shaped over a pole, then air dried before baking. In some instances the lower leg of the person shaping the tile was used as a form: these were known as shinbone-shaped tile. Nearly all the handmade tile were horseshoe shaped until after 1850, though a few round tile were made by shaping around a short pole then removing the pole.

Materials used for making early drain tile in the United States. All tile shown here were made before 1850.

B. F. Whartenby of Scoi Yase, N. Y. established the first tile factory in the United States. He manufactured horseshoe-shaped tile with "club feet", that is, the exposed edges were broadened to help keep the tile from sinking into the floor of the trench in which it was laid.

In some cases, two sections of these early horseshoe tile were fitted together to form an oval tile. In other cases, three tile would be laid together to form a pyramid, that is, two tile would be laid parallel a few inches apart and a larger third tile laid on top of them. This arrangement gave much greater drainage capacity than could a single row of tile.

After the tile making machine was imported



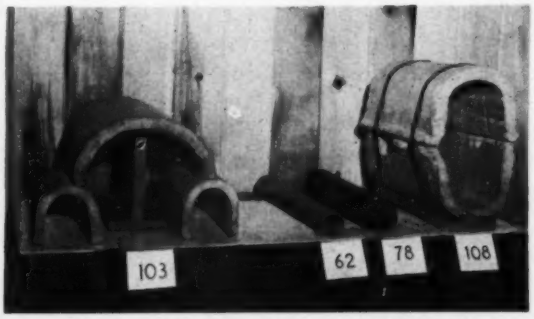
Some specimens of early drain tile. No. 102 is made of brick mortar in a brick mold. No. 3 is an open horseshoe with "club feet", and is one of a lot of 8,000 sold by B. F. Whartenby in 1853, for $78.38. No. 77 is a round tile, shaped around a pole, about 1850. No. 2 is one of the 2 tiles brought from Scotland by John Johnston in 1835. No. 9 is a shinbone tile made about 1850.

Note:—The author is engineerig specialist, Soil Conservation Service, Waterloo, N. Y.

All photographs used with this article were made from the M. M. Weaver collection of drain tile at Waterloo, N. Y. The collection also includes about 200 other interesting types of old tile, not shown here.

Shapes of some early drain tile: No. 36, flat-bottom horseshoe; No. 48, egg-shaped; No. 21, V-bottom horseshoe; No. 71, oval with 2 flat sides; No. 97, square; No. 68, round with 2 flat sides.

Some types of early tile joints: No. 222 is a Y-joint to connect a 2-inch tile to a 5-inch main, laid in 1856; No. 44 is a 2-inch tile with a 1-inch opening for connecting tile; No. 109 is a sawed joint laid in the 1860's and still operating in 1957; No. 110 is a 1-inch stone tile with lead joints, laid about 1850.



Some odd tile used in New York around 1850. No. 103 was laid as shown (except for the board supporting the center arch) on the John Johnston farm: an 11 inch arch was laid on top of two 4-inch open horseshoe tile; No. 62 is a 1-inch tile from the Borst farm near Utica, N. Y.; No. 78 is a ¾-inch tile, which is the smallest in the Weaver collection; No. 108 was laid as shown for tile main.

This man demonstrates the method of shaping a "shinbone" tile. The tile on the floor was shaped around a pole.

in 1848, some factories began making round tile. The change over from horseshoe shaped to round tile took place gradually from 1850 to 1865. A few horseshoe tile were manufactured after 1865, but not in quantity, because the round tile were proving to be much more efficient. Hexagonal tile also became popular in some communities around 1865. After that, most tile factories standardized on either the round or hexagonal shapes although there were some variations. In some cases, one or two flat edges were formed on round tile, while various other shapes, including square tile were occasionally made.

As with the tile shape, there were also many variations in types of joints. Metal bands, burlap, tar paper, and other materials were used to keep sand and soil from filtering into the tile at the joints. Clay collars were used by some. A socket pipe, similar to a bell and spigot pipe, was also used in some cases. Joint types were also standardized gradually, and the types we use today evolved.

REVIEWS

FUNDAMENTALS OF SOIL SCIENCE. By C. E. Millar, L. M. Turk, and H. D. Foth. 3rd Edition. 526 pp. Illustrated. 1958. New York: John Wiley & Sons, Inc. $7.75.

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THIS edition comes after 7 years' experience with the 2nd edition, now well-known as a satisfactory introductory textbook. Since the 2nd edition was remarkably up to date, relatively few changes have been needed. The chapters on Soil Development, Physical Properties, Classification of Soils, and Soil Moisture have been most changed. Enough new material has been added to keep the book well up to date.

The major emphasis in this text, as in the earlier editions, is on the soils and soil-management problems of temperate humid regions. The entire treatment of arid lands is shorter than the discussion on liming. And, the authors unconsciously assume that all clays are much like those of Michigan when they discuss soil management, even though they emphasize some of the differences between clays in the same chapters. Still, for the purposes intended, this is an excellent book.

—GUY D. SMITH

THE AFFLUENT SOCIETY. By John Kenneth Galbraith. 368 pp. 1958. Boston: Houghton-Mifflin Co. $5.

IN this book Dr. Galbraith has given us an up-to-date analysis of our high-producing and high-spending society. He points out the weaknesses in applying economic principles developed in an age of scarcity, when most people were poor, to our present society in which only a minority is poor. He asserts that, "The shortcomings of economics are not original error but uncorrected obsolescence."

The author is a well-known scholar of economic science, including agricultural economics; yet, he writes simply, with unusual clarity, and with rare good humor.

The explanations of our present economic problems by such a well-qualified authority are important to every citizen. Dr. Galbraith has brought an enormous amount of study to bear on his task. Especially, has he worked hard on the writing; therefore, it is lucid and easy to read. Perhaps many readers may not agree with some details. Yet, most will be stimulated to think for themselves. It is that kind of book.

Following the analysis, the author goes ahead and makes proposals for change. Like all new ideas and proposals, these will be controversial, perhaps highly so. One doubts that Dr. Galbraith expects them to be embraced either immediately or in the form he suggests. But in a democracy even the cautious reader must applaud intelligent attempts to explain our major economic and social problems in lucid terms for laymen by a scholar of unquestioned integrity.

—CHARLES E. KELLOGG

HYBRID GRASSES FOR THE SOUTHEAST.—The ARS and Georgia Exp. Sta. recently announced the release of two hybrid forage grasses adapted to many parts of the southeastern U. S. One is an annual pearl millet hybrid called Gahi-1. In tests at Tifton, Ga., Gahi-1 produced 50 percent more forage than common pearl millet. The other is a hybrid Pensacola Bahiagrass, called Tifhi-1. This hybird outyielded regular Pensacola Bahia during 4 years of testing. Steers gained an average of about 70 pounds more per acre per year on Tifhi-1 than on Pensacola Bahia.